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MEMORANDUM

Date: July 8, 1997

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From: Rich Feeley

Subject: Longitudinal Trends in Household Expenditure for Medical Care and Drugs in Russia

The attached tables are largely self-explanatory. The data is taken from household expenditure surveys conducted over the period form 1992 to 1996 with USAID support. The original sample contained 7,200 households. I have attached information on the methodology and accuracy of the sampling technique which was supplied to me.

The respondents were asked:

- Did you spend money on medical care in the previous month?
- If yes, How much did you spend on medical care?
- Did you spend money on drugs in the previous month? (except in December 1994)
- If yes, how much did you spend on drugs?

The data provided to Boston University by USAID showed, for each income quintile, the maximum monthly household income in the quintile, and the average of monthly household incomes in the quintile. It also showed the average household income for the entire survey.

For each expenditure (medical care, drugs), the data showed the following for each income quintile and for the total sample:

- percentage of respondents reporting expense in the previous month
- mean value of the expenses reported
- mean value of the expenses reported after a "5% trim;
- median value of the reported expenses.

Because medical expenses can be expected to have a very wide distribution, including high costs infrequently incurred, we elected to use the sample means without the 5% trim.

To get average expenditures for all households, we multiplied the percentage of households in an income group which reported an expenditure times the mean reported expenditure. To get the percentage of total household expenditure going for medical care or drugs in an income group, this average expenditure was divided by the average income in the group. Results are shown as a percentage of current household income for medical care, drugs, and medical care and drugs combined.

Discussion

The data show that the proportion of income which households spend on drugs and medical care has increased, breaking upwards sharply after 1993. For all households, medical care expenditures have increased from .4% of monthly income in September 1992 to 1.0% and 0.9% in the last two surveys (October 1995 and October 1996). Drug expenditures have increased from .5% of monthly income to 2.5% and 2.6% in the same time period. Overall, the proportion of monthly income spent on medical care and drugs has almost quadrupled from .9% to 3.5%.

The proportion of monthly income spent on medical care has increased for all income groups, but it has increased more rapidly for the poorest. Despite the constitutional guarantee of free medical care, the poorest quintile reported spending 7.1% of monthly income on medical care in 1995 and 14.7% of income on medical care in 1996. Percentages spent on drugs rose to 11.6% in 1995 and 30.5% in 1996. In the 1996 sample, it would appear that the poorest 20% of the population spent almost one half of their monthly income on drugs and medical care. Clearly, the safety net has failed, and if this data is correct, the poorest are giving up food and other essentials to purchase drugs and medical care.

Is this result plausible. It may be. The income data show a decrease in average income for the poorest quintile from an 101,601 roubles per month in 1995 to 70,636 in 1996. Since the survey question is based on cash income, this may reflect the non-payment of government pensions. It is likely that the poorest quintile is heavily composed of pensioners. These older individuals will also have much higher medical needs because of their age. If drug subsidy programs were not delivering maintenance drugs to these individuals last year, then they may have been forced to purchase life-sustaining medications despite a fall in real income. This would help to explain the extraordinarily high levels of expenditure in this group in 1996.

Although many have viewed "private" medical expenditures in Russia as a phenomenon of the newly rich, this is not borne out by the expenditure data. The wealthiest 20% of the sample consistently spend the lowest percentage of income on drugs and medical care. Even out of pocket expenditures for medical care are not much higher as a percentage of income than they are for the middle classes. The rich devote a much lower proportion of income than the poor to purchasing medical care.

What are the implications of this information for national health policy. First, private payments cannot be ignored as a minor aberration when making health policy. If household income is 50% of GDP, the 1995 and 1996 surveys would place out-of-pocket expenses for health care (drugs and medical care combined) at 1.75% of GDP. This is approximately half of the amount reported for governments and mandatory insurance funds. In a country where free medical care is a constitutional right, about one third of total health care expenditures are already coming directly from households.

Second, when the data is broken down by income group, we can see that the "safety net" has broken down. The poorest, by any definition the least able to pay for their own medical expenditures, are required to pay by far the highest proportion of their incomes for drugs and medical care. Failure to pay pensions and social benefits may explain some of the recent rapid increase in the proportion of household expenditures by the poorest. But it also seems that this group is being forced to pay for medical care and drugs due to a breakdown in the system of care and subsidies which is supposed to provide these benefits for free.

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		SURVEY DATE SEPT. 1992	FEB. 1993	AUGUST 1993	NOV. 1993	'DEC. 1994	'OCT. 1995	OCT. 1996
EXPENSE AS % OF INCOME QUINTILE	ONE							
	MEDICAL	1,8%	0,1%	0,2%	0,2%	2,0%	7,1%	14,7%
	DRUGS	1,5%	1,5%	1,4%	3,5% *		11,6%	30,5%
	TOTAL MEDICAL	3,3%	1,5%	1,6%	3,8% *		18,7%	45,3%
	TWO							
	MEDICAL	0,4%	0,1%	0,1%	0,3%	1,4%	1,1%	1,1%
	DRUGS	1,1%	1,2%	1,4%	2,1% *		4,6%	6,2%
	TOTAL MEDICAL	1,5%	1,3%	1,5%	2,3% *		5,7%	7,3%
	THREE							
	MEDICAL	0,4%	0,3%	0,2%	0,1%	0,9%	0,8%	0,5%
	DRUGS	0,7%	0,7%	1,0%	1,6% *		3,5%	3,6%
	TOTAL MEDICAL	1,1%	1,1%	1,2%	1,7% *		4,3%	4,1%
	FOUR							
	MEDICAL	0,3%	0,2%	0,1%	0,2%	0,9%	0,9%	1,1%
	DRUGS	0,4%	0,7%	0,6%	1,0% *		2,2%	2,3%
	TOTAL MEDICAL	0,8%	0,9%	0,7%	1,2% *		3,2%	3,3%
	FIVE							
	MEDICAL	0,3%	0,1%	0,1%	0,5%	1,4%	0,8%	0,6%
	DRUGS	0,3%	0,4%	0,3%	0,6% *		1,6%	1,4%
	TOTAL MEDICAL	0,6%	0,5%	0,5%	1,1% *		2,4%	1,9%
	ALL HSHLDS							
	MEDICAL	0,4%	0,1%	0,1%	0,3%	1,3%	1,0%	0,9%
	DRUGS	0,5%	0,6%	0,6%	1,1% *		2,5%	2,6%
	TOTAL MEDICAL	0,9%	0,8%	0,8%	1,4% *		3,5%	3,5%

		SURVEY DATE SEPT. 1992	FEB. 1993	AUGUST 1993	NOV. 1993	'DEC. 1994	'OCT. 1995	OCT. 1996	
INCOME QUINTILE	ONE								
	MAX INCOME	2 193	6 100	19 424	40 600	140 000	210 000	249 000	
	AVE. INCOME	1 490	4 036	12 642	26 655	88 160	101 601	70 636	
	TWO								
	MAX INCOME	4 000	11 000	35 000	76 000	250 000	427 000	500 000	
	AVE. INCOME	3 172	8 666	27 199	57 723	196 098	321 458	375 217	
	THREE								
	MAX INCOME	6 197	18 000	55 617	119 536	400 000	700 000	870 000	
	AVE. INCOME	5 114	14 378	44 731	95 775	325 680	559 463	679 419	
	FOUR								
	MAX INCOME	10 000	30 000	92 000	203 576	665 000	1 200 000	1 550 000	
	AVE. INCOME	8 025	23 650	71 689	155 684	515 303	930 096	1 171 823	
	FIVE								
	MAX. INCOME	38 798	112 480	399 886	857 425	3 640 000	6 000 000	8 000 000	
	AVE. INCOME	16 193	47 898	153 111	337 846	1 166 722	2 179 361	2 883 867	
	ALL HSEHLD AVERAGE	6 698	19 448	61 766	134 662	452 949	813 181	1 032 060	
EXPENSE MEDICAL QUINTILE	CARE ONE								
	% w/ Expense	3,4%	0,8%	0,9%	1,0%	5,7%	3,2%	3,2%	
	Ave. Expense	774	388	2 572	6 395	30 342	225 750	325 350	
	Ave. All Hshlds.	26	3	23	64	1 729	7 224	10 411	0
	TWO								
	% w/ Expense	3,2%	1,2%	0,5%	1,0%	8,4%	3,9%	3,6%	
	Ave. Expense	428	800	5 400	15 500	33 782	87 696	115 117	
	Ave. All Hshlds.	14	10	27	155	2 838	3 420	4 144	0
	THREE								
	% w/ Expense	4,6%	1,1%	1,4%	0,9%	7,4%	4,2%	4,1%	
	Ave. Expense	469	4 208	6 653	14 010	39 522	101 497	86 846	
	Ave. All Hshlds.	22	46	93	126	2 925	4 263	3 561	0
	FOUR								
	% w/ Expense	4,3%	2,4%	1,6%	1,9%	7,9%	8,3%	7,5%	
	Ave. Expense	597	1 565	4 361	15 640	61 596	102 495	164 537	
	Ave. All Hshlds.	26	38	70	297	4 866	8 507	12 340	
	FIVE								
	% w/ Expense	6,2%	2,7%	2,1%	3,1%	13,0%	9,8%	9,1%	
	Ave. Expense	690	1 914	10 556	52 960	130 113	175 620	176 500	
	Ave. All Hshlds.	43	52	222	1 642	16 915	17 211	16 062	
	ALL HSEHLD								
	% w/ Expense	4,3%	1,6%	1,3%	1,6%	8,5%	5,8%	5,5%	
	Ave. Expense	599	1 814	6 560	29 240	68 691	136 956	168 646	
	Ave. All Hshlds.	26	29	85	468	5 839	7 943	9 276	
EXPENSE DRUGS QUINTILE	ONE								
	% w/ Expense	31,4%	31,0%	27,4%	29,5%		34,6%	35,9%	
	Ave. Expense	71	191	635	3 201		34 095	60 076	

TWO							
% w/ Expense	36,2%	33,2%	30,7%	32,8%		41,2%	40,0%
Ave. Expense	95	315	1 229	3 616		35 802	58 275
Ave. All Hshlds.	34	105	377	1 186	0	14 750	23 310
THREE							
% w/ Expense	37,0%	35,8%	33,8%	35,1%		43,3%	45,5%
Ave. Expense	94	298	1 291	4 279		45 443	53 725
Ave. All Hshlds.	35	107	436	1 502	0	19 677	24 445
FOUR							
% w/ Expense	39,6%	39,6%	35,8%	37,3%		41,6%	48,0%
Ave. Expense	89	413	1 281	4 023		50 266	55 663
Ave. All Hshlds.	35	164	459	1 501	0	20 911	26 718
FIVE							
% w/ Expense	40,6%	39,1%	33,8%	36,1%		47,5%	54,0%
Ave. Expense	132	495	1 546	5 708		71 868	74 163
Ave. All Hshlds.	54	194	523	2 061	0	34 137	40 048
ALL HSEHLD							
% w/ Expense	36,9%	35,7%	32,3%	34,2%		41,6%	44,6%
Ave. Expense	97	350	1 219	4 210		48 716	60 934
Ave. All Hshlds.	36	125	394	1 440	0	20 266	27 177

Description of the sampling methodology

(Based on the description provided by the RLMS team)

Phase I (Rounds 1-4)

A sample of 7,200 households was drawn. Our hope was retain at least 5,000 households over the life of the panel survey. This goal was met. The response rate started at 88.8%, remained above 80% for three rounds, and dropped to 76% only in the fourth round. These rates are quite respectable by international standards, and outstanding by Western European standards.

Within each household, data were solicited for all individuals residing therein, including unmarried minors attending school elsewhere. (Adults responded for children.). We obtained individual data from 89% to 97% of individuals in participating households during each round. Since we sought information about all household members rather than sampling only some of them, the figures represent the population of adult individuals (not just of households) without any special weighting except for non-responses.

The sample can also be evaluated informally by comparing demographic statistics with corresponding parameters from the census. Bear in mind that a certain amount of demographic change has occurred since the census, so the census itself does not constitute a perfect standard.

The correspondence between household size in the census and in the Phase I sample is very good. For example, in urban areas, the census reports that two-person households constituted 33.1% of all multiperson households; in our sample, the percentage ranges from 32.7% to 34.8% over the four waves. In the census, 3.4% of all urban multiperson households consisted of six or more members; in our sample, from 2.9% to 3.7% do. Only occasionally are deviations as high as two percentage points observed. The deviations are somewhat higher in the rural areas. However, such deviations may be attributed to the fact that the definition of a household in the Soviet census differs from our definition, and the care taken in distinguishing multiple households living in a single-family residence was not the same in the census as in this study.

Next, consider some comparisons based on individual rather than household data. For example, in the 1989 census, males from 0 to 14 years of age living in urban areas constituted 8.37% of the total population; in Rounds I-IV of the RLMS, the corresponding percentages were 7.96%, 8.56%, 8.16%, and 8.71%, respectively--without using any corrective post-stratification weights. There are many similarly heartening comparisons. However, one can find some sharper deviations. For example, the total percentage of rural citizens was 23.2% in Round I rather than 26.57%, as in the 1989 census.

Also, consider the distribution of respondents by nationality (ethnicity). Please remember that the Phase I sample was not designed to represent all ethnic groups any more than the Current Population Survey or the General Social Survey in the U.S. is designed to represent, say, Vietnamese, Eskimos, or the Chinese in San Francisco. In the 1989 census, 81.5% of the Russian Federation claimed to be ethnic Russian, in Round I of this sample, 82.7%. In the census, 3.8% were Tatar, in this sample, 3.1%. In the census, 3.0% were Ukrainian, in this sample, 2.5%.

Similarly, consider the distribution of respondents' education. In the 1989 census, 6.5% of the Russian population aged 15 and older had completed three or fewer years of schooling; in our sample, 5.0% had done so. In the census, 27.4% had completed general secondary school; in our sample, 24.6% had done so. In the census, 11.3% claimed to have completed higher education; in our sample, 14% made this claim. This upward educational bias is far less than is typically observed in non-probability based surveys of the Russian Federation.

While the above figures are generally encouraging, they concern only demographic variables. We turn now to the calculation of the design effect for one of the most important variables: total household income. As an illustration, data from Round III are used. Since inflation occurred during field work, ruble amounts are deflated to June 1992 levels: the mean total household income was 7,950 rubles; the standard deviation was 12,585 rubles. (Incidentally, inflated to December 1994 levels, these amounts would be 628,050 rubles and 994,215 rubles, respectively.)

Most statistical packages (and consequently most analysts) disregard sample design effects. They are not calculated easily. Furthermore, they can vary for every variable in a questionnaire as well as for all composite variables. Nevertheless, given the small number of PSUs in this survey, it seemed necessary to perform the calculations to provide some assurance of the level of precision achieved. The results appear below in Table 2.

Table 2: Design Effects for Total Household Income

NUMBER OF PSUs	DEFT (SQUARE ROOT OF DESIGN EFFECT)	STANDARD ERROR IN JUNE, 1992 RUBLES	Size of 95% Confidence Interval
20	3.16	534 rubles	±13.2%
40	2.34	395 rubles	±9.7%
60	1.72	291 rubles	±7.2%
Simple Random Sample	1.00	169 rubles	±4.2%

Had this been a simple random sample of 5,546 households from the entire population of households in the Russian Federation, the design effect would have been precisely 1.00 by definition (see the bottom row). Using the standard formulas, the standard error would have been computed to be 169 rubles; the 95% confidence interval expressed in terms of the mean household income would have been ±4.2% (i.e., (1.96 * 169 rubles) / 7,950).

All national samples involve stratification and clustering to cut costs. The convenience and savings exact a toll: the confidence interval around the results (or the standard deviation of the results) becomes larger, i.e., precision is decreased. This is measured with the design effect, or with the square root of the design effect. In this survey, the design effect (DEFF) for total household income was about 9.975, based on data from Rounds I and III. Its square root (DEFT) is 3.16 (see the top row). In other words, the standard error (534 rubles) is 3.16 times as large as it would have been had we obtained these results from a simple random sample. Consequently, the precision is worse: ±13.2%. As the table reveals, had we employed 40 rather than 20 PSUs, we would have achieved an estimated precision level of ±9.7%; had we employed 60 rather than 20 PSUs keeping the same sample size, we would have achieved a precision level of ±7.2%. This constitutes a more reasonable point of comparison than a simple random sample, since no simple random sample of large countries is feasible.

In conclusion, please remember that sampling error is only one of several kinds of error that can taint the results of surveys. One must also be concerned about the quality of the questionnaire, of interviewer training and fieldwork, of data entry and cleaning--all of which were conducted in new ways in the RLMS Phase I project conducted with Goskomstat. Though we in fact pushed for a larger number of PSUs, in hindsight we see that we were perhaps unwittingly fortunate that Goskomstat's resources limited the number of PSUs to 20. This allowed us to concentrate sufficiently on the somewhat unmeasurable non-sampling aspects of quality while giving up a tolerable and quantifiable amount of sampling precision.

Phase II (Rounds 5-7)

The household response rate exceeded 80%. In both Rounds V and VI, individual questionnaires were obtained from over 97% of the people listed on the household rosters. The response rates did indeed vary across PSUs depending on the proportion of households in rural areas. However, since we anticipated that in over-sampling, the actual proportion of completed household interviews compares well to the proportion of the population in each stratum. Most entries differ by less than .004; St. Petersburg constituted the worst exception (.0294 rather than .0355).

The distribution of household size in the sample, within both rural and urban localities, corresponds well to the figures from the 1989 census. Bear in mind that single-member households are excluded from the comparison because the census includes many institutionalized people, while our sample explicity excludes them. Thus, there is no valid basis for comparison.

The multivariate distribution of the sample by sex, age, and urban-rural location compares quite well with the corresponding multivariate distribution of the 1989 census. Of course, due to random sampling error and changes in the distribution since the 1989 census, we would not expect perfect correspondence. Nevertheless, there is usually a difference of only one percentage point or less between the two distributions.

Another way to evaluate the adequacy (or efficiency) of the sample is to examine design effects. One of the important factors in determining the precision of estimates in multistage samples is the mean ultimate cluster (PSU) size. All else being equal, the larger the size, the worse the precision. In Phase I of the RLMS, the average cluster size approached 360--a large number dicated by constraints imposed by our collaborators. Thus, although the sample size hovered around 6,000 households, precision was less than we would have liked for a sample of that size.

In the Phase II sample, the situation was considerably better. Although there were only 4,000 households, the mean size of clusters was much smaller than in the Phase I sample. There were 35 PSUs with about 100 households each; even this was an improvement over the average of 360 in the design of the RLMS Phase II sample. However, in the three self-representing areas, the respondents were drawn from 61 PSUs. Thus, the mean cluster size in the entire the sample was about 42, i.e., 4,000/(35+61). Given these much smaller cluster sizes, we had reason to expect that precision in this survey would be as good as it was in Phase I, despite the smaller sample size. This, in fact, turned out to be the case in Round V, the first round of Phase II. The mean total household income was 510,146 rubles, with a 95% confidence interval of 65,950 (i.e. 12.9%).